

Running SAS at Austin Using TSO: A Beginner's Guide

Mark A. Greenbaum
Center for Health Care Evaluation
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AUSTIN CHEAT SHEETS—HOW TO PERSUADE THE AAC TO READ and RUN YOUR SAS PROGRAMS

1. "Austin" is short for the AAC (Austin Automation Center), a facility where nationwide VA data is collected, processed, and stored. In addition, authorized users can access and manipulate these VA datasets, store data and programs, and submit jobs to answer research questions.
2. For this session, we will look at use of extended care beds at Palo Alto VA HCS between August 1, FY01 and Sept. 30, FY01 (Sept. 30, 2001). The "runfile" written to extract this information from Austin is stored in RMTPRD.S640MG1.LIB.AFIND. In Austin parlance, AFIND is a "MEMBER" (one of several) of library RMTPRD.S640MG1.LIB. "Library" is to Austin what "Directory" is to a PC. A Member is to Austin what a File is to a PC.

NOTE: We will learn here about libraries that are "Partitioned Data Sets (PDS); i.e., a library that contains several members. We will not cover "Sequential Data Sets."

I. First Steps: Authorization and Logging On

Authorization

Jan Beyer has forms to request access to specific VA databases at Austin. For example, you must justify your need for the Real Social Security Number database. After approval from Palo Alto VA and Austin, you will receive an Austin account number (S640xxx).

Logging On

Download Telnet3270 (from <http://helpdesk.uvic.ca/how-to/support/win95/qns3270.html>), or place an IRMS work order to install SMARTCOM/PERSOFT. (For Telnet, the AAC address is 152.125.190.39.) Alternatively, use the internet to access the VA "Host on Demand" IBM Emulator.

PRINTOUT OF INITIAL TSO SCREENS:

1. Log Onto TSO

```
Facility Selections

PF FACILITY          STATUS
1 H - Help
2 T - TSO (AUSTSO)   ACTIVE
3 R - ROSCOE (AUSROS) ACTIVE

SELECTION→ T
```

2. Account Number and Password

```
ENTER LOGON parameters below

Userid→ S640xxx
Password→ Your Password*

Length of 8, no repeating, at least
1 alpha, 1 numeric, and 1 "special"
```

After "READY" prompt, Type **SPF**

II. ALLOCATING SPACE FOR A LIBRARY / NAVIGATING TSO

THE PRIMARY OPTION MENU

This may look complex, but you'll mostly use options 2 (EDIT) and 3 (VIEW) only.

ISPF Primary Option Menu

```

0  Settings          Terminal and user parameters
1  View              Display source data or listings
2  Edit              Create or change source data
3  Utilities          Perform utility functions
4  Foreground
.
Option → 3

```

Utility Selection Panel

```

1  Library          Compress or print data set. Print index listing. Print,
                      rename, delete, browse, edit or view members
2  Data Set          Allocate, rename, delete, catalog, uncatalog, or display
                      information of an entire data set                [LIBRARY]
3  Move/Copy         Move, copy, or promote members or data sets      [LIBRARIES]
4  Dslist            Print or display (to process) list of data set names. [LIBRARIES]

```

Then, hit **2** for "data set" to get to the DATA SET UTILITY

```

*****
*  NAVIGATION HINT: At command line type "END," then another "END" to get back to PRIMARY*
*  OPTION MENU. Now type =3.2. In other words, you could have typed =3.2 at Primary      *
*  Option Menu instead of typing '3' then '2'.                                         *
*****

```

Data Set Utility [LIBRARY]

A Allocate new data set	C Catalog data set
R Rename entire data set	U Uncatalog data set
D Delete entire data set	S Short data set information
blank Data set information	V VSAM Utilities

ISPF Library:

Project . . .	S640xxx	-YOUR ACCOUNT NAME-
Group . . .	EXAMPLES	-2nd level name-your choice-
Type . . .	LIB	- LIB indicates this is a PDS-

Other Partitioned, Sequential or VSAM Data Set:

Data Set Name . . .	
Volume Serial . . .	(If not cataloged, required for option "C")

Data Set Password . .	(If password protected)
-----------------------	-------------------------

Option ==> **A**

1. Type parameters for Project, Group, and Type as shown above.
2. Then, type 'A' and <RETURN> to set up the parameters (e.g., allocate space) of your LIBRARY. Screen will say "Allocate New Data Set."

NOTE:For a shared library (others can copy your files), "Project" should be RMTPRD, "Group" can be any name. "Type" remains LIB.

Complete the parameters as shown below.

Allocate New Data Set

More: +

Data Set Name . . . : S640MG1.EXAMPLES.LIB

Management class . . .	(Blank for default management class)
Storage class . . .	(Blank for default storage class)
Volume serial . . .	2INT0H (Blank for system default volume) **
Device type . . .	(Generic unit or device address) **
Data class . . .	(Blank for default data class)
Space units . . .	TRACK (BLKS, TRKS, CYLS, KB, MB, BYTES or RECORDS)
Average record unit	(M, K, or U)
Primary quantity . .	30 (In above units)
Secondary quantity	5 (In above units)
Directory blocks . .	45 (Zero for sequential data set) *
Record format . . .	FB
Record length . . .	80
Block size6480 (alternatively, 27920; multiple of 8)
Data set name type :	PDS (LIBRARY, HFS, PDS, or blank) *

Press <ENTER>: The upper right hand corner of next screen will display "Data Set Allocated." "S" will give you brief information about the LIBRARY you just created. See Appendix A for creating a larger library.

IV. Copying Someone Else's File: Using the Editor and the Jobcard statement to Copy a "RUNFILE" to Your Library

Part 1. Copying someone else's runfile is the fastest way to begin, but the **FIRST LEVEL** of the **LIBRARY** from which you're copying **MUST BE NAMED "RMTPRD."** (e.g. **RMTPRD.S640MG1.LIB**). Otherwise you'll need the other person to copy their runfile(s) to an **RMTPRD** library (**See Appendix A**).

1. To copy someone's **RMTPRD**-level file to your Library, **type =3.3** (then <ENTER>) to get to the **MOVE/COPY UTILITY PANEL**. First, specify the transfer **FROM** Library Name:

```

Move/Copy Utility
                                                    More:      +

C  Copy data set or member(s)           CP Copy and print
M  Move data set or member(s)           MP Move and print
L  Copy and LMF lock member(s)          LP Copy, LMF lock, and print
P  LMF Promote data set or member(s)     PP LMF Promote and print

Specify "From" Data Set below, then press Enter key

From ISPF Library:
  Project . . . RMTPRD          (--- Options C, CP, L, and LP only ---)
  Group   . . . S640MG1 . . . . .
  Type    . . . LIB
  Member  . . . AFIND          (Blank or pattern for member list,
                                "*" for all members)

From Other Partitioned or Sequential Data Set:
  Data Set Name . . .
  Volume Serial . . . (If not cataloged)

Option ==> C

```

2. NEXT, specify the "TRANSFER TO" Library Name (e.g., the library you just created):

```

Menu  RefList  Utilities  Help
-----
COPY      From RMTPRD.S640MG1.LIB (AFIND)
                                                    More:      +

Specify "To" Data Set Below

To ISPF Library:
  Project   . . S640xxx          Replace option:
  Group    . . . EXAMPLES      Enter "/" to select option
  Type     . . . LIB           Replace like-named members
  Member   . . . findviz       (Blank unless member is to be renamed)

To Other Partitioned or Sequential Data Set:
  Data Set Name . . .
  Volume Serial . . .          (If not cataloged)

Data Set Password . . .        (If password protected)

To Data Set Options:
  Sequential Disposition      Pack Option      SCLM Setting
  1 1. Mod                    3 1. Yes          3 1. SCLM

Command ==> <ENTER>

```

3. Hit <ENTER>, then =3.4. Type the first level name (S640xxx) and hit <ENTER>.
4. Type 'E' to the left of "EXAMPLES." 'E' is for EDIT and is another way to select a file.
5. Press <ENTER> again, and type 'E' to the left of "findviz," press <ENTER> and you'll see the copied runfile "findviz."

RUNFILE "FINDVIZ" (Which is a "member" of your "Library" S640xxx.EXAMPLE.LIB):

```
DD 000001 //S640MG1N JOB XXXUNKA8,S640MG1,
000002 //          MSGCLASS=I,NOTIFY=&SYSUID
000003 /* This JCL is in S640MG1.ASAS1.LIB (ARENO)
s640xxx.examples.lib.findviz
DD 000004 /*MAIN LINES=(60,W)
000005 //STEP1 EXEC SAS
000006 /*IN1 DD DSN=MDPPRD.PRO.SAS.DMS.CPMINI(0),DISP=SHR
000007 /*IN2 DD DSN=MDPPRD.PRO.SAS.NAT.FY01.OPCNAMEF,DISP=SHR
000008 //IN3 DD DSN=MDPPRD.MDP.SAS.XM01,DISP=SHR
000009 //LIBRARY DD DSN=MDPPRD.MDP.FMTLIB6,DISP=SHR
000010 //SYSIN DD *
000011
000012 OPTIONS NOCENTER LS=80 PS=66;
000013
000014 *proc contents data=in3.xm01*;
000015
000016 data one; set in3.xm01(keep=scrssn sta3n dbedsect admitday
000017 disday dxprime);
000018
000019 if sta3n=640;
000020 if disday ge '01aug01'd and disday le '30sep01'd;
000021 proc sort; by scrssn disday;
000022 proc print data=one(obs=10);
```

Using JOBCARD and !JCK, Submitting Your Job

1. Delete Lines 1-4 (DD in line 1 and DD in line 4, then <ENTER>), and replace them with your OWN Job Control Language lines 1-4 by typing **"JOBCARD."**
2. In Line 1, change s640xxx8 to s640xxx7 (by placing the cursor over the 8, then typing 7).
3. Delete any lines that have "MSG" to the left ('D' to the left of the line you want to delete).
4. At the command line, type **!JCK, then <ENTER>**. A message should come back that there are NO flagged statements. If not, see Appendix **XXX** (When your JCL has errors).
5. Type **"SUB"** (then <ENTER> to submit your job to the Austin Mainframe computer."

V. Examining Your Job, Printing, and Transferring

To identify the status of your job, type `'=j'` and then `'ST.'`

S322 or **1310** in the "Comp" column means your job took too long and "Abended."

W-Output means your job is done.

X-SYP means your job is still running

Type **'S'** to the left side of the job you want to examine.

STATUS 6,755S 1X 2W 0H 0T 15,384 Records									
Row 1 of 3									
Cmd	Jobname	Job-ID	Status	Process	Stepnum	Stepname	JP	Pos	Comp Records
----->									
	S640WF16	JOB15564	W-OUTPUT	OUTSERV	1	6		1310	15,059
S	S640WF16	JOB15522	W-OUTPUT	OUTSERV	1	6	----		325
	S640WF1	TSU15212	X-SYP	MAIN	1	1 SPF	15		0

THE "ST SCREEN": LISTS ALL YOUR JOBS

DSSTAT S640MG1N JOB 02650 361 Records									
Row 1 of 5									
Cmd	DDname	Stepname	Procname	Que*	C	Pri	Cop	Hld	Destination Records
----->									
	JESMSG LG			HLD	I	6	1	LOCAL	54
	JESJCL			HLD	I	6	1	LOCAL	88
	JESYSMSG			HLD	I	6	1	LOCAL	136
	SASLOG	STEP1	SAS	HLD	I	6	1	LOCAL	50
S	SASLIST	STEP1	SAS	HLD	I	6	1	LOCAL	

THE JOB DETAIL SCREEN (After pressing `'S'` to the left of the job you want to examine displayed in the ST Screen.

AT THE JOB DETAIL SCREEN:

1. IF there is a JCL error, the job will crash quickly. Put an **'S'** to the left side of JESMSG LG or JESYSMSG in the JOB DETAIL SCREEN to find and analyze errors.
2. IF there is an error in programming, you'll see SASLOG but not SASLIST (the output). Type **S** to the left of SASLOG, then type **f 'err'** to locate errors in your runfile.

If you have SASLOG and SASLIST, congratulations, your program ran. *Still, look at the SASLOG: At each data step, is the N of observations what you would logically expect? Is there anything else unexpected? Generally, the more "PROC PRINTS" at each data set, the better you will really understand how the computer has processed your information!*

3. Type **S** to the left of SASLIST and, again, examine the OUTPUT to check for "face validity."

Printing and Downloading Your SASLst (Output) and/or SASLOG (Record of job)

1. QUICK WAY: Print screen—easiest if you don't need to save it, or if a small output.

2 SAVE TO HARD DRIVE WITHOUT USING FTP:

Put cursor on Edit option of Telnet. At the first screen, select COPY, then go to next screen (F8), and hit append all, and so on until the last screen of output. After the last "append all," hit the Edit menu button again, and then click on "Save AS." You may want to save to Microsoft Word or some other word Processor.

4. SAVE TO HARD DRIVE USING FTP

Here you "extract" the data and download it to your Hard Drive with "File Transfer Protocol" (FTP) software. This is the best method when you have a lot of output. You will need FTP software installed on your computer. Type 'E' to the left of SASLIST. <ENTER> The following screen will come up:

```
S640MG1N JOB 02650          Extract Parameters
For Extract to DASD Dataset:
Dataset name  ===> <type name here> for example "VISITS.LST"
Disposition   ===> SHR          (OLD, MOD, NEW or SHR)
Page eject    ===> NO           (YES or NO to force eject for each dataset)
```

NOTE: When you use FTP, you can locate this file under your LIBRARY (S640xxx.VISITS.LST). You can also type =3.4, and then S640xxx. to locate your Extracted SASLOG (Annotated runfile) or SASLIST (Output).

VII. A Brief Look at JCL

ALWAYS USE !JCK to check your JCL before submitting a job, and always check for typos.

```

1 //S640MG17 JOB XXXUNKA9,S640MG1,                * These lines
2 //          MSGCLASS=I,NOTIFY=&SYSUID,            * supplied by
3 //USER=S640MG1,PASSWORD=                          * command
4 //* THIS JCL IS IN S640MG1.ASAS1.LIB(RESPCOMP)      * "JOB CARD"
5 //*MAIN LINES=(60,W)                               *

6 //STEP1 EXEC SAS,REGION=3000K,SOUT=R,WORK='100,50' ***Instruction to run SAS
with this much space. YOU may need to delete all text after 'SAS' because of
possible ABEND error.***;

7 //IN1 DD DSN=MDPPRD.MDP.SAS.SG01(0),DISP=SHR      *Shared Austin Data Set that
                                                    will be input (read);

8 //OUT DD DSN=S640MG1.SAS.TESTCOPY,DISP=(NEW,CATLG), *New data set you're
9 //          SPACE=(CYL,(1000,500),RLSE),UNIT=RMTINT *creating*;

10 //LIBRARY DD DSN=MDPPRD.MDP.FMTLIB6,DISP=SHR      *Format Library
11 //SYSIN DD *

[END OF JCL] [Beginning of SAS]
12 OPTIONS NOCENTER LS=80 PS=66;                    *Output Options*;
13 Data ONE; SET IN1.SG01; *SAS data Step. Create temp set called ONE which
14 If STA3N=640; *reads in IN1.SG01. Select records where STA3N=640*;

15.DATA OUT.TESTCOPY; SET ONE; *Next SAS data step. Create Permanent data set
*Out.testcopy" which contains any manipulations
*you included in data one*;

```

Trouble-Shooting JCL

- ABEND ERROR: Always examine JCL messages (=j, st) to detect where this happened.
 - Delete " ,REGION=8000K,SOUT=R,WORK='1000,200' " phrase in STEP1 statement. If that is NOT the problem, adjust REGION and WORK (e.g. REGION=1000K WORK='100,10')
 - Adjust job level in Line 1 UP (e.g., change XXXUNKA8 to XXXUNKA9)
 - Adjust space parameters of your OUT dataset. If using UNIT=RMTBIG change to UNIT=RMTINT, or vice versa.
- ID errors: in lines 1 and 3, write YOUR account number. In line 7, the first level name of the IN account should NOT start with someone else's Account number.
- JCL/SAS MISMATCH: Do IN and OUT names in 13 and 15 match JCL names in lines 7 and 8.
- OTHER CONVENTIONS:
 - JCL lines always begin with // with no space immediately after. In general, determine whether your spacing is correct.
 - WRITE YOUR JCL IN CAPITAL LETTERS.
 - .NO semicolons at the end of a JCL line; but needed after OPTIONS and SAS statements.
- CONTINUATION STATEMENTS (Lines 8 and 9). Since Line 9 is a continuation of 8, type a comma after line 8. Start line 9 (after typing the //) about 12 spaces to the right.
- You may wish to retype the apparent "problem line" in case there are hidden errors.

<ENTER>

3. Type 'S' next to the files you want to copy to the new RMTPRD Library.

```

COPY          S640MG1.ASAS1.LIB      TO RMTPRD.S640MG1.ASAS1  Row 00001 of
00030
  Name      Prompt      Size      Created      Changed      ID
. EXAMPLE          34      2001/10/31    2001/10/31 11:50:32  S640MG1
s EXTTEST          16      1998/10/29    2001/09/12 16:51:27  S640MG1
s FINDNAME         65      2001/08/14    2001/11/03 13:26:05  S640MG1
. FINDVIZ          12      1998/10/29    2001/11/02 16:04:00  S640MG1
. MAKESET          14      2001/06/12    2001/11/05 11:42:01  S640MG1
. NCNEWVIZ         245      2001/07/12    2001/07/13 16:11:26  S640MG1
s NEWPAD           193      2001/03/13    2001/08/14 11:20:55  S640MG1
s ONENAME          17      2001/08/17    2001/08/31 12:35:43  S640MG1

```

4. The next screen verifies that the members were copied to the RMTPRD Library.

```

-----
COPY          S640MG1.ASAS1.LIB      TO RMTPRD.S640MG1.ASAS1  Row 00001 of 00030
  Name      Prompt      Size      Created      Changed      ID
. EXAMPLE          34      2001/10/31    2001/10/31 11:50:32  S640MG1
. EXTTEST *COPIED    16      1998/10/29    2001/09/12 16:51:27  S640MG1
. FINDNAME *COPIED   65      2001/08/14    2001/11/03 13:26:05  S640MG1
. MAKESET          14      2001/06/12    2001/11/05 11:42:01  S640MG1
. NCNEWVIZ         245      2001/07/12    2001/07/13 16:11:26  S640MG1
. NEWPAD *COPIED    193      2001/03/13    2001/08/14 11:20:55  S640MG1
. ONENAME *COPIED   17      2001/08/17    2001/08/31 12:35:43  S640MG1

```

5. Now NEWUSERS can log on and copy members from the RMTPRD library into their S640XXX Library.

Appendix B: Creating a Larger Library

Allocate New Data Set

```

Data Set Name . . . : S640MG1.EXAMPLES.LIB
Management class . . . (Blank for default management class)
Storage class . . . . (Blank for default storage class)
Volume serial . . . . 2BIG08 (Blank for system default volume) **
Device type . . . . . (Generic unit or device address) **
Data class . . . . . (Blank for default data class)
Space units . . . . . CYLINDER (BLKS, TRKS, CYLS, KB, MB, BYTES
or RECORDS)
Average record unit (M, K, or U)
Primary quantity . . 30 (In above units)
Secondary quantity 5 (In above units)
Directory blocks . . 45 (Zero for sequential data set) *
Record format . . . . FB
Record length . . . . 80
Block size . . . . . 27920
Data set name type : PDS (LIBRARY, HFS, PDS, or blank) *

Command ==> <ENTER>

```

Appendix C. Transferring S640xxx Datasets to RMTPRD.S640xxx DATASETS

Copying a Dataset. In Section VII above we created dataset OUT.S640MG1.SAS.TESTCOPY. If the person who created this dataset left CHCE, a new person could NOT use this dataset because it does not start with RMTPRD as the first level name. Here are some solutions:

1. Call Austin (512/326-6780) within 90 days after the person's departure and ask them to change the files to the new employee's Account Number. It appears that after 90 days the data set will no longer be available.
2. Change the dataset to an RMTPRD level dataset:

A. MAKE AN "OUT" DATASET WITH "RMTPRD" as the FIRST LEVEL NAME

```
000001 //S640MG17 JOB XXXUNKA8,S640MG1,
000002 //          MSGCLASS=I,NOTIFY=&SYSUID
000003 //* THIS JCL IS IN S640MG1.ASAS1.LIB(RESPCOMP)
000004 //*MAIN LINES=(60,W)
000005 //STEP1 EXEC SAS,REGION=1000K,SOUT=R,WORK='100,50'

000006 //IN1  DD DSN=S640MG1.SAS.TESTCOPY,DISP=SHR

000007 //OUT   DD DSN=RMTPRD.S640MG1.LIB.TESTCOPY,DISP=(NEW,CATLG) ,
000008 //      SPACE=(CYL,(1000,500),RLSE),UNIT=RMTBIG

000009 //LIBRARY DD DSN=MDPPRD.MDP.FMTLIB6,DISP=SHR
000010 //SYSIN  DD *
000011 OPTIONS NOCENTER LS=80 PS=66;
000012 DATA OUT.TESTCOPY;      SET IN1.TESTCOPY;
000013
```

B. After examining output of the job above, test it:

```
000001 //S640WF16 JOB XXXUNKA8,S640WF1,
000002 //          MSGCLASS=I,NOTIFY=&SYSUID
000003 //* THIS JCL IS IN S640WF1.EXAM2.LIB(SCRPB99)
000004 //*MAIN LINES=(60,W)
000005 //STEP1 EXEC SAS,REGION=1000K,SOUT=R,WORK='100,50'
000006 //IN1    DD DSN=RMTPRD.S640MG1.LIB.TESTCOP2,DISP=SHR
000007 //MAINFILE DD DSN=MDPPRD.SYS.SAS.NAT.LIB.MAINFILE,DISP=SHR
000008 //LIBRARY DD DSN=MDPPRD.MDP.FMTLIB6,DISP=SHR
000009 //SYSIN  DD *
000010 OPTIONS NOCENTER LS=80 PS=66;
000011 DATA ONE; SET IN1.TESTCOP2; IF VIZDAY LE '03OCT01'D;
000012 PROC PRINT DATA=ONE(OBS=1);
```

Appendix D. Other Resources:

1. VIRECC: http://vaww.aac.va.gov/operations/austin_info.asp:

learn how to sign on to TSO and use TSO / ISPF at the AAC (targeted for beginners).
learn how to view and manage job output using (E)JES software.
general information and common procedures.

learn how to set up the File Transfer (FTP) command under Windows and how to perform FTP's.

learn about JCL.

learn about dataset management and use at the AAC.

2. University of Georgia TSO Guide: <http://www.uga.edu/ucns/hostsys/mvs/tso-user-guidea.html>

3. Help while on TSO.

4. HERC site for information and links.